

**From:** [Young, Howard S.](#)  
**To:** [Zhen, Davis](#)  
**Cc:** [Sheldrake, Sean](#); [Scott Coffey](#)  
**Subject:** RE: Correction (PH1) ..... RE: Upcoming Bathy Field Work - questions on the single beam echosounder data collection  
**Date:** Friday, June 15, 2018 7:28:10 AM

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Davis,

Ken's email response indicated that bathymetry coverage images of previous days surveying would be available the following morning. I would like to request the ETA of this so we get it in time to be useful. I ghost wrote an email to request to Ken for your consideration. We have staff out this morning to check in on the tailgate H&S and observe QC checks at the dock.

Thanks

Howard

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Ken,

Can you provide an ETA of when the email images of yesterday's bathymetric coverage will be available this morning. We would like to have this information as soon as possible to supplement our oversight during the period when we could not the PWCs on the water.

Thanks,

Davis

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**From:** Zhen, Davis <[Zhen.Davis@epa.gov](mailto:Zhen.Davis@epa.gov)>  
**Sent:** Wednesday, June 13, 2018 4:31 PM  
**To:** Young, Howard S. <[younghs@cdmsmith.com](mailto:younghs@cdmsmith.com)>; Sheldrake, Sean <[sheldrake.sean@epa.gov](mailto:sheldrake.sean@epa.gov)>  
**Subject:** Fwd: Correction (PH1) ..... RE: Upcoming Bathy Field Work - questions on the single beam echosounder data collection

Thanks,

Sent from my iPhone, please excuse typos

\*\*\*\*\*

Davis Zhen, Manager

Site Cleanup Unit 2

Office of Environmental Cleanup

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\*\*\*\*\*

Begin forwarded message:

**From:** "Tyrrell, Ken" <[ken.tyrrell@aecom.com](mailto:ken.tyrrell@aecom.com)>  
**Date:** June 13, 2018 at 4:30:03 PM PDT  
**To:** "Zhen, Davis" <[Zhen.Davis@epa.gov](mailto:Zhen.Davis@epa.gov)>  
**Cc:** Scott Coffey <[coffeyse@cdmsmith.com](mailto:coffeyse@cdmsmith.com)>

**Subject: Correction (PH1) ..... RE: Upcoming Bathy Field Work - questions on the single beam echosounder data collection**

Davis,

With apologies, slight correction to the below.

The horizontal/vertical checks will be performed on PH1, which is onshore.

The below note erroneously indicated PH2.

So all QA checks will be performed onshore.

Apologies for the mistake.

**Ken Tyrrell**

Project Coordinator – Portland Harbor  
Design and Consulting Services Group  
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**From:** Tyrrell, Ken

**Sent:** Wednesday, June 13, 2018 4:24 PM

**To:** Zhen, Davis <[Zhen.Davis@epa.gov](mailto:Zhen.Davis@epa.gov)>

**Cc:** Scott Coffey <[coffeyse@cdmsmith.com](mailto:coffeyse@cdmsmith.com)>

**Subject:** RE: Upcoming Bathy Field Work - questions on the single beam echosounder data collection

Davis,

Here are the replies to your questions. Keep in mind the figures/maps of intended coverage areas were sent previously.

- How will coverage displays of acquired bathymetry data be generated in the field? Existing real-time coverage will be displayed on the display screen on the Personal Watercraft (PWC). As single beam data is acquired, data will be painted to the screen on each individual PWC. See Bathy FSP Appendix A – Figure 4 for photo of display screens

EPA's expectation are that oversight inspectors will be able to observe the coverage displays as data is collected throughout the day? There is not a feasible way to provide inspector oversight of coverage during operations. The PWCs will be working small pockets with no shore access. Further, each PWC will only show coverage for the day for that unit. Combined coverage would be available the following morning via email images as the effort of merging the data will occur back in the DEA office to generate coverage images for the previous days effort. As access allows through private properties, EPA could observe from land at the areas being surveyed.

- What specific quality control tests will be performed to verify calibration of the single beam echosounder and what is the frequency and location of these tests? Checks will include a position check and sonar derived elevation check. A start of PWC acquisition position check will be conducted for each PWC. Additional position checks provide no further value as the GPS base station is fixed and not

deployed daily. After a sound speed observation is made and entered into each PWC, a start of acquisition and end of last day of acquisition pole sounding on the river bed at the Swan Island Boat Ramp with an RTK GPS observation of the water line will be observed. The river bed elevation computed from subtracting the pole sounding from the water elevation will be compared to the processed single beam elevation of the river bed. If the water is shallow, the RTK GPS will be used to take a direct reading in the river bed. Sound speed profiles will be acquired in each fill area to be surveyed and applied during processing if there is a significant change.

- At what location and frequency will check-lines be run for quality analysis of the single beam data and how will the cross-line data be checked in the field to verify sonar swath angle used on a flat bottom meets the survey accuracy? Cross line checks are not compared in the field, even with multibeam data. This is a post mission check after data has been processed. That said, one PWC single beam cross-line per area will be run as well as overlap of existing multibeam data for later analysis. As per the Bathy FSP - Appendix A, crossline comparisons will be conducted to document that sensor biases, GNSS height data and echosounder data, and sound velocity profiles are accounted for in the data set. A statistical analysis of the crossline comparisons will be conducted using CARIS HIPS which provides a report, compiling statistics by beam number for each junction. In addition, a statistical analysis of the cross-line data to main scheme survey lines will be conducted and included in the survey report.
- What control points will be used to check the horizontal accuracy of the GPS and how frequently will the checks be done? Consistent with the approved SOP for Horizontal and Vertical Survey Control in the Surface Sediment FSP, position checks would occur at the designated monument, PH-2 benchmark location, at the boat launch located in Swan Island Lagoon. This will occur at the start and end of the day for each PWC.
- How will the vertical accuracy of the single beam echosounder be checked and at what frequency? As mentioned above vertical accuracy will be checked daily at the start and end of the day for each PWC. Additionally, vertical accuracy will be checked at the start of acquisition and end of last day of acquisition pole sounding on the river bed at the Swan Island Boat Ramp and when comparing to cross line and multibeam data.
- How will the effects of wave action on depth measurements be evaluated and what is the maximum wave height that will be allowed during the single beam echosounder measurements? The RTK GPS height is recorded at 5 hertz (5 times per second) and will be used to correct for vertical motion of the PWC. The beam angle of the single beam transducers is 4 degrees and will take the shortest path to the riverbed which will take into account vessel roll or pitch of +/- 4 degrees.

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**From:** Zhen, Davis [<mailto:Zhen.Davis@epa.gov>]

**Sent:** Tuesday, June 12, 2018 4:41 PM

**To:** Tyrrell, Ken <[ken.tyrrell@aecom.com](mailto:ken.tyrrell@aecom.com)>

**Cc:** Scott Coffey <[coffeyse@cdmsmith.com](mailto:coffeyse@cdmsmith.com)>

**Subject:** Upcoming Bathymetry Field Work - questions on the single beam echosounder data collection

Ken,

Per our conversation earlier, below are the questions we have regarding your upcoming Bathymetry field work.

Thanks,

Sent from my iPhone, please excuse typos

\*\*\*\*\*

Davis Zhen, Manager

Site Cleanup Unit 2

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Davis,

We have included the following questions on how the personal water craft single beam echosounder survey will be conducted for planning EPA oversight. Please let us know if you have any questions.

- How will coverage displays of acquired bathymetry data be generated in the field? EPA's expectation are that oversight inspectors will be able to observe the coverage displays as data is collected throughout the day?
- What specific quality control tests will be performed to verify calibration of the single beam echosounder and what is the frequency and location of these tests?
- At what location and frequency will check-lines be run for quality analysis of the single beam data and how will the cross-line data be checked in the field to verify sonar swath angle used on a flat bottom meets the survey accuracy?
- What control points will be used to check the horizontal accuracy of the GPS and how frequently will the checks be done?
- How will the vertical accuracy of the single beam echosounder be checked and at what frequency?
- How will the effects of wave action on depth measurements be evaluated and what is the maximum wave height that will be allowed during the single beam echosounder measurements?

EPA's expectations are that oversight inspectors will be able to observe the quality control checks throughout the survey.

Howard S. Young, LG | CDM Smith

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**From:** Tyrrell, Ken <[ken.tyrrell@aecom.com](mailto:ken.tyrrell@aecom.com)>

**Sent:** Tuesday, June 12, 2018 1:05 PM

**To:** Zhen, Davis <[Zhen.Davis@epa.gov](mailto:Zhen.Davis@epa.gov)>

**Cc:** Coffey, Scott <[CoffeySE@cdmsmith.com](mailto:CoffeySE@cdmsmith.com)>; Young, Howard S. <[younghs@cdmsmith.com](mailto:younghs@cdmsmith.com)>; Jon Dasler (<[Jld@deainc.com](mailto:Jld@deainc.com)>)

**Subject:** FW: An Update -- Upcoming Bathy Field Work

Davis,

An update on the Bathy field work (see below).

Ken

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**From:** Jon Dasler [<mailto:Jld@deainc.com>]

**Sent:** Tuesday, June 12, 2018 11:43 AM

**To:** Tyrrell, Ken <[ken.tyrrell@aecom.com](mailto:ken.tyrrell@aecom.com)>

**Cc:** Pretare, Jennifer <[jennifer.pretare@aecom.com](mailto:jennifer.pretare@aecom.com)>; Luke Smith (<[Luke.Smith@Geosyntec.com](mailto:Luke.Smith@Geosyntec.com)>)

**Subject:** RE: Upcoming Bathy Field Work

Ken

Given the forecast now calling for 70% chance of rain for Wednesday, **we are moving our operations start to Thursday**. I reviewed coverage priorities with Luke. We will have graphics of our line plan for proposed coverage later today.

Jon

**Jon L. Dasler, PE, PLS, CH** | Senior Vice President, Director of Marine Services

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**From:** Tyrrell, Ken [<mailto:ken.tyrrell@aecom.com>]

**Sent:** Tuesday, June 12, 2018 8:52 AM

**To:** Zhen, Davis <[Zhen.Davis@epa.gov](mailto:Zhen.Davis@epa.gov)>

**Cc:** Scott Coffey <[coffeyse@cdmsmith.com](mailto:coffeyse@cdmsmith.com)>; Young, Howard S. <[younghs@cdmsmith.com](mailto:younghs@cdmsmith.com)>; Jon Dasler <[Jld@deainc.com](mailto:Jld@deainc.com)>

**Subject:** FW: Upcoming Bathy Field Work

Davis,

We are providing the below note from Jon Dasler w/ DEA in an effort to keep you current and up to date about the upcoming Bathymetric Field

Work.

We will continue to keep you up to date as the plans and logistics are finalized.

See below.

**Ken Tyrrell**

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**From:** Jon Dasler [<mailto:jld@deainc.com>]

**Sent:** Monday, June 11, 2018 3:04 PM

**To:** Tyrrell, Ken <[ken.tyrrell@aecom.com](mailto:ken.tyrrell@aecom.com)>; Luke Smith  
([Luke.Smith@Geosyntec.com](mailto:Luke.Smith@Geosyntec.com)) <[Luke.Smith@Geosyntec.com](mailto:Luke.Smith@Geosyntec.com)>

**Cc:** Moody, Nicky <[nicky.moody@aecom.com](mailto:nicky.moody@aecom.com)>; Keith Kroeger  
<[KKroeger@Geosyntec.com](mailto:KKroeger@Geosyntec.com)>

**Subject:** RE: EPA Requested Info on Upcoming Bathy Field Work  
Ken

I will put together a line plan for this effort and have something tomorrow. We are looking at acquisition Wednesday through Friday if needed. We cannot take any observers on the personal watercraft. Crew would launch at St Johns or Swan Island depending on operations for the day. I will have more details tomorrow.

Jon

**Jon L. Dasler, PE, PLS, CH** | Senior Vice President, Director of Marine Services

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